

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-IV • EXAMINATION – WINTER 2013**

**Subject Code: 142103****Date: 26-12-2013****Subject Name: Mechanical Behavior and Testing of Materials****Time: 02:30 pm to 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define and explain the following properties: **07**  
i) Ductility ii) Toughness iii) Resilience iv) % Elongation  
(b) Define Hardness. Explain Rockwell Hardness Test method. Mention **07**  
advantages and limitations of this method.
- Q.2** (a) Explain about Tensile test. Discuss the factors affecting tensile properties **07**  
of material.  
(b) Write a note on Micro Hardness Test. Give the applications. **07**
- OR**
- (b) Discuss about Vicker Hardness Test method. Enlist advantages and **07**  
limitations.
- Q.3** (a) Define Dislocation. Differentiate between Edge and screw dislocation. **07**  
(b) Discuss the strengthening mechanism in metals and alloys? **07**
- OR**
- Q.3** (a) Explain different Techniques for observation of dislocation. **07**  
(b) Define Plastic deformation. Explain plastic deformation in polycrystalline **07**  
materials.
- Q.4** (a) 'Testing of material is an important task for industry' - justify comment. **07**  
Classify testing methods.  
(b) Write a note on Mechanism of creep deformation in metals. **07**
- OR**
- Q.4** (a) What do you mean by Calibration? Why the calibration of testing **07**  
instruments is required? Explain by help of proper examples.  
(b) Define creep. Draw a typical creep curve and explain the various stages in **07**  
creep.
- Q.5** (a) Differentiate between ductile and brittle fracture. Give Mechanism of **07**  
Ductile fracture.  
(b) What do you mean by S-N curve? Differentiate between ferrous alloys and **07**  
non ferrous alloys with reference to their respective S-N curves.
- OR**
- Q.5** (a) Describe Charpy Impact test. Derive Relationship for energy absorbed by **07**  
specimen. Mention Factors affecting Test.  
(b) Define Fatigue. Explain mechanism of fatigue in metals. What are main **07**  
factors affecting fatigue properties of materials.

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